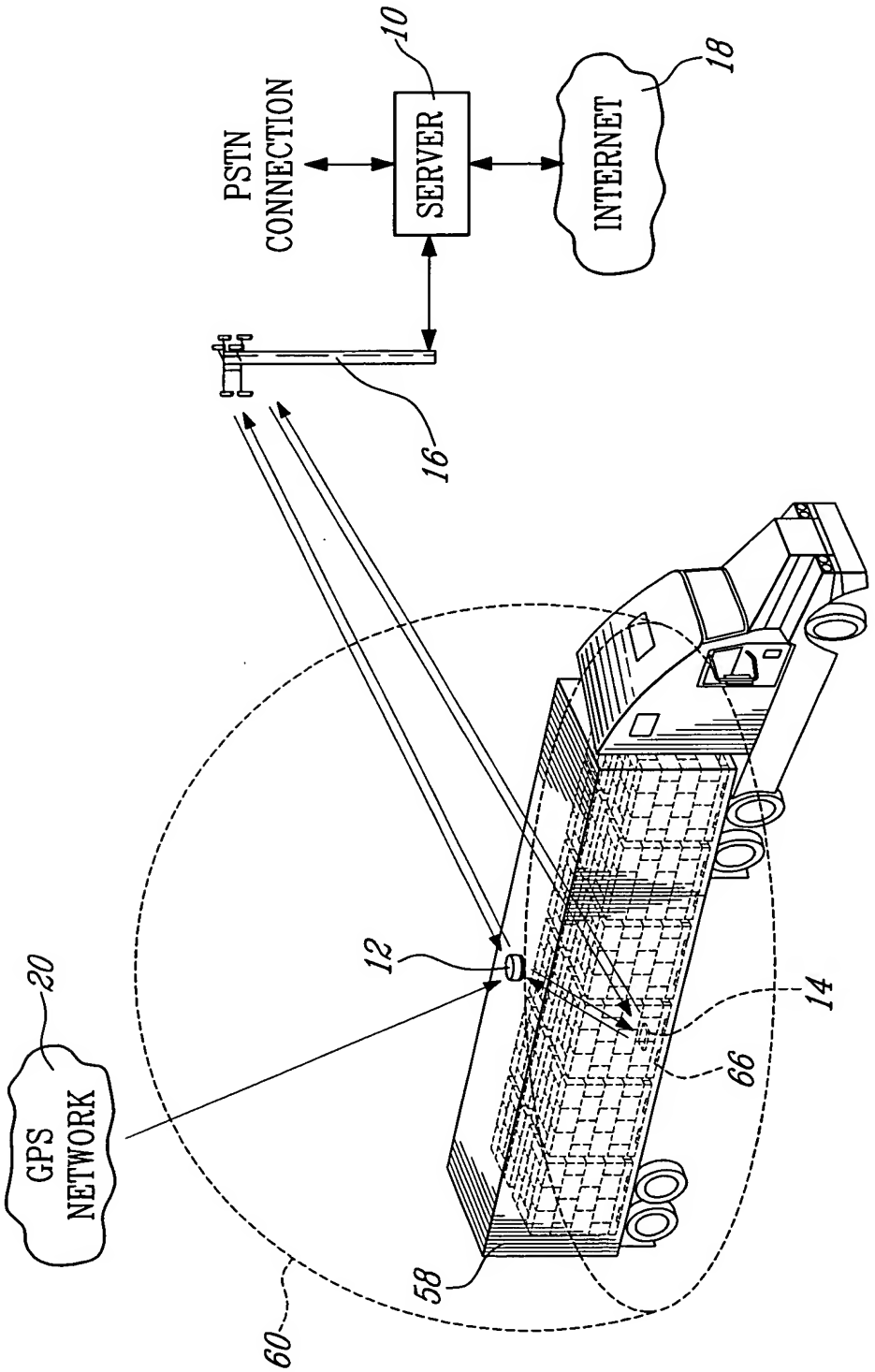
PSTN
CONNECTION
SERVER
INTERNET
10
18
16
GPS
NETWORK
20
12
14
66
58
60

Fig. 1

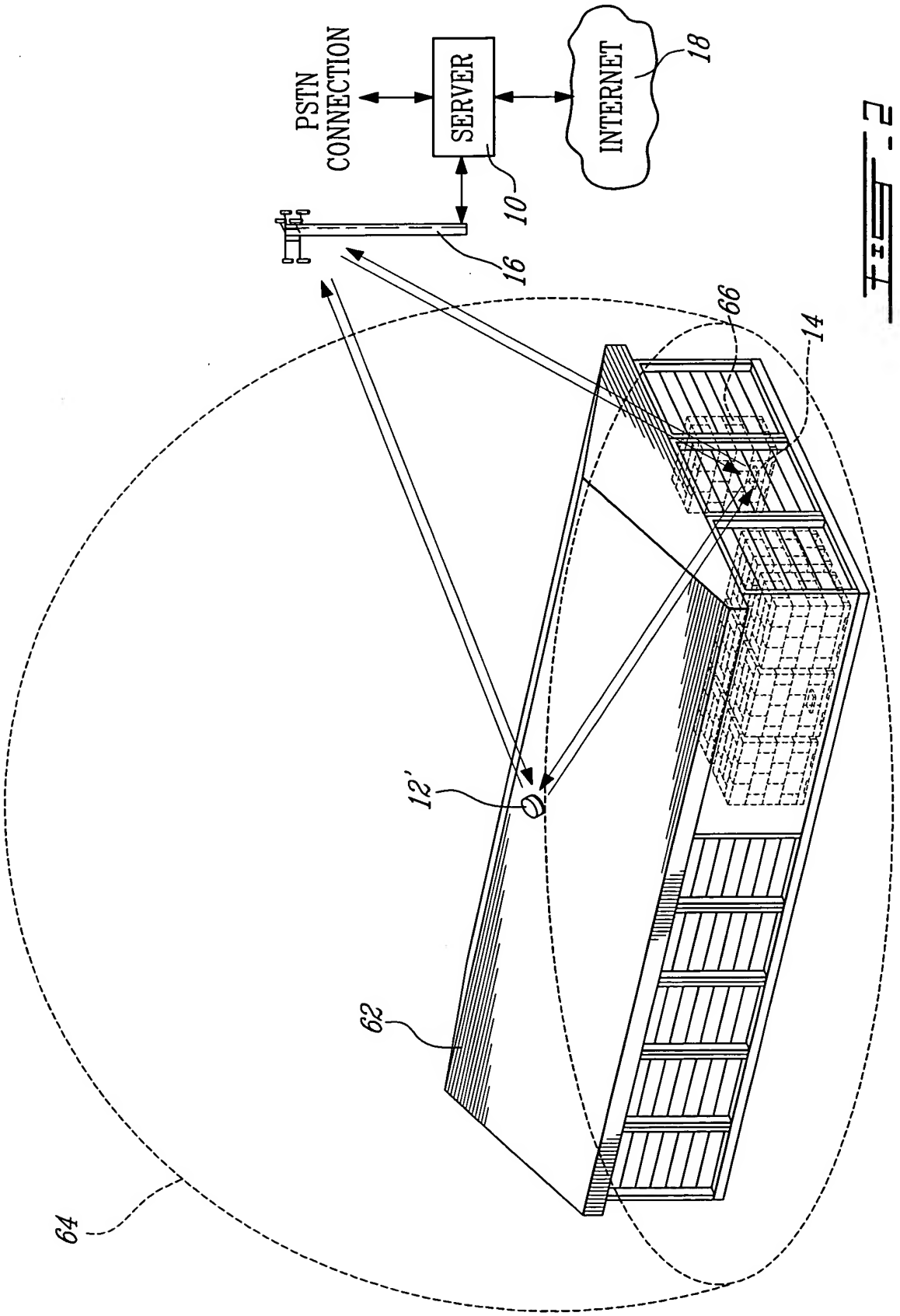

Fig. 2

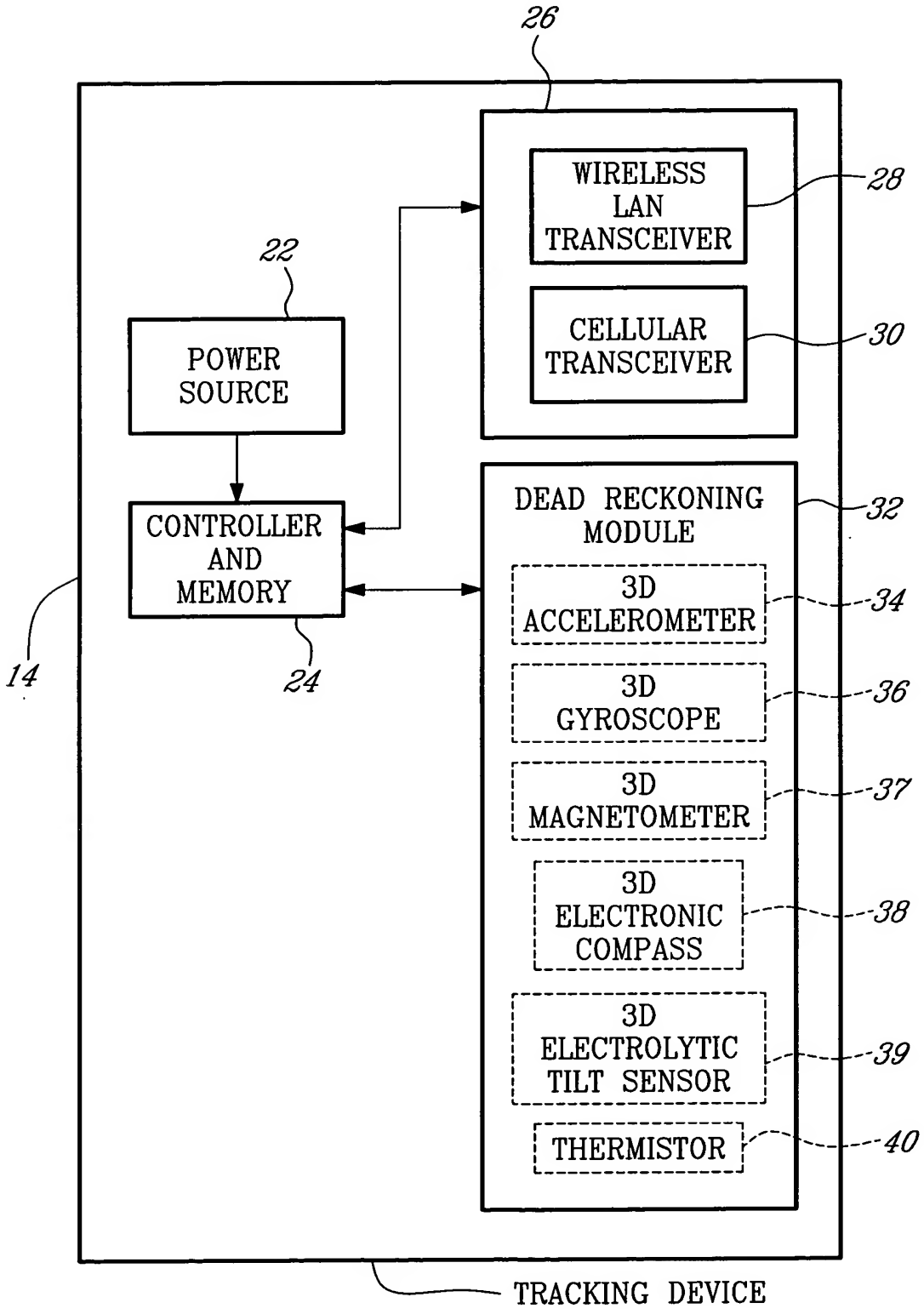
26
WIRELESS LAN TRANSCEIVER
28
CELLULAR TRANSCEIVER
30
22
POWER SOURCE
CONTROLLER AND MEMORY
24
14
DEAD RECKONING MODULE
32
3D ACCELEROMETER
34
3D GYROSCOPE
36
3D MAGNETOMETER
37
3D ELECTRONIC COMPASS
38
3D ELECTROLYTIC TILT SENSOR
39
THERMISTOR
40
TRACKING DEVICE

FIG. 3

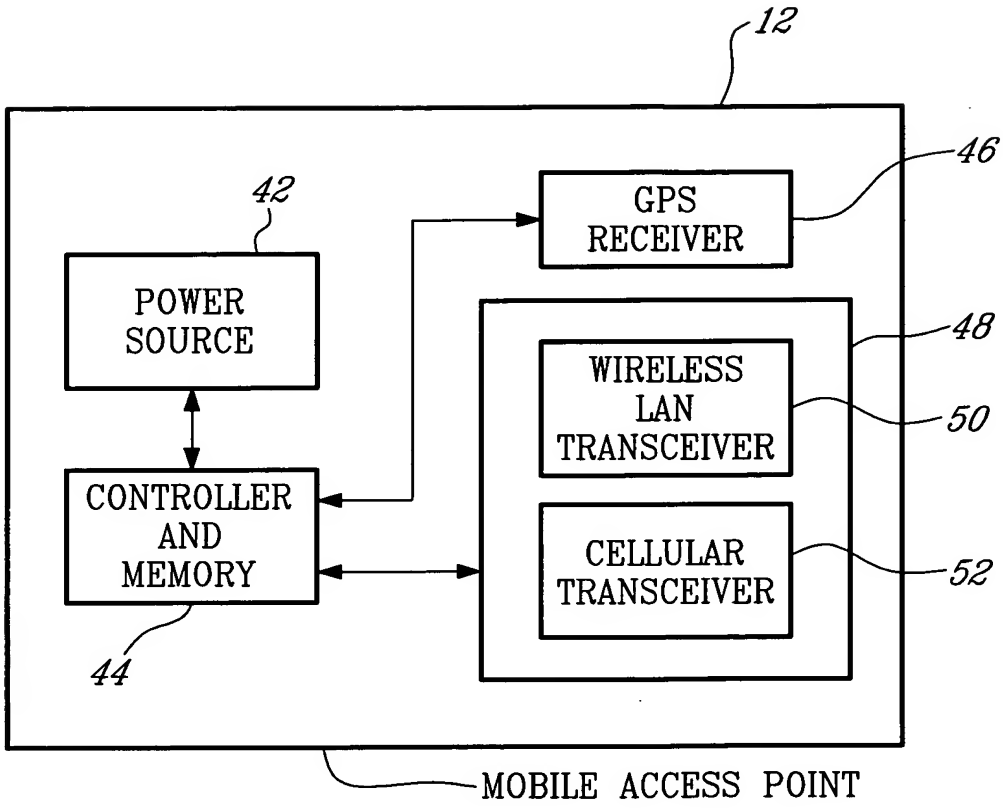
12
46
42
GPS
RECEIVER
POWER
SOURCE
48
WIRELESS
LAN
TRANSCEIVER
50
CONTROLLER
AND
MEMORY
CELLULAR
TRANSCEIVER
52
44
MOBILE ACCESS POINT

Fig. 4A

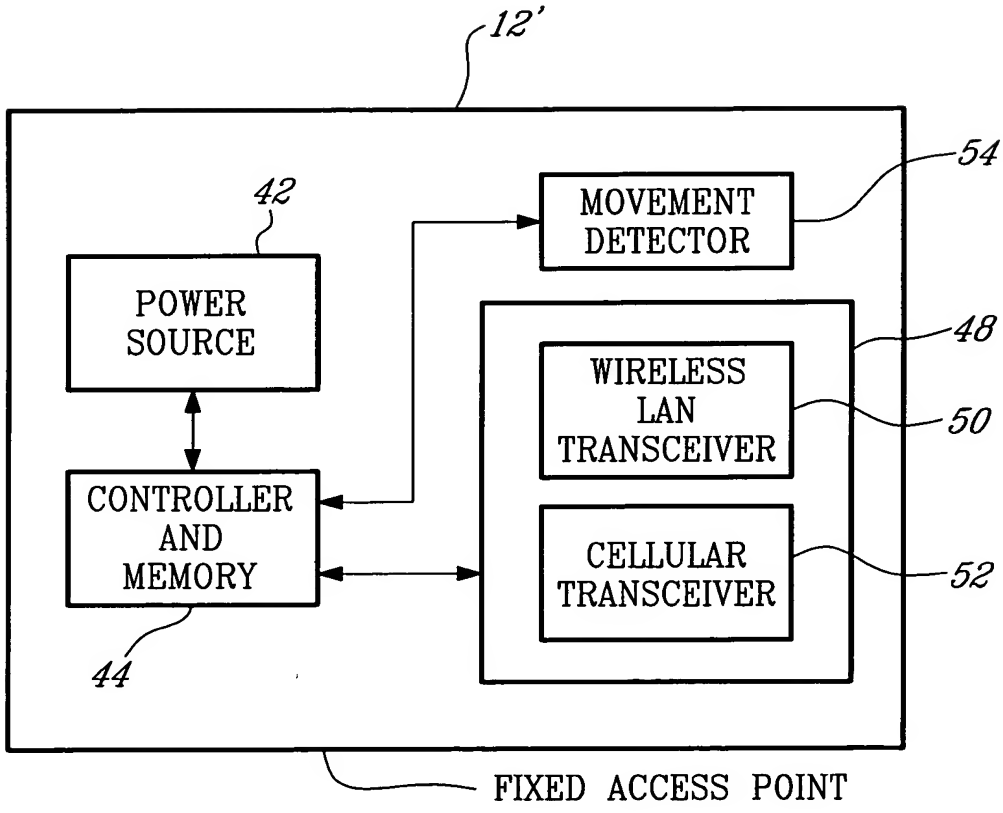
12'
42
POWER SOURCE
CONTROLLER AND MEMORY
44
MOVEMENT DETECTOR
54
48
WIRELESS LAN TRANSCEIVER
50
CELLULAR TRANSCEIVER
52
FIXED ACCESS POINT

Fig. 4B

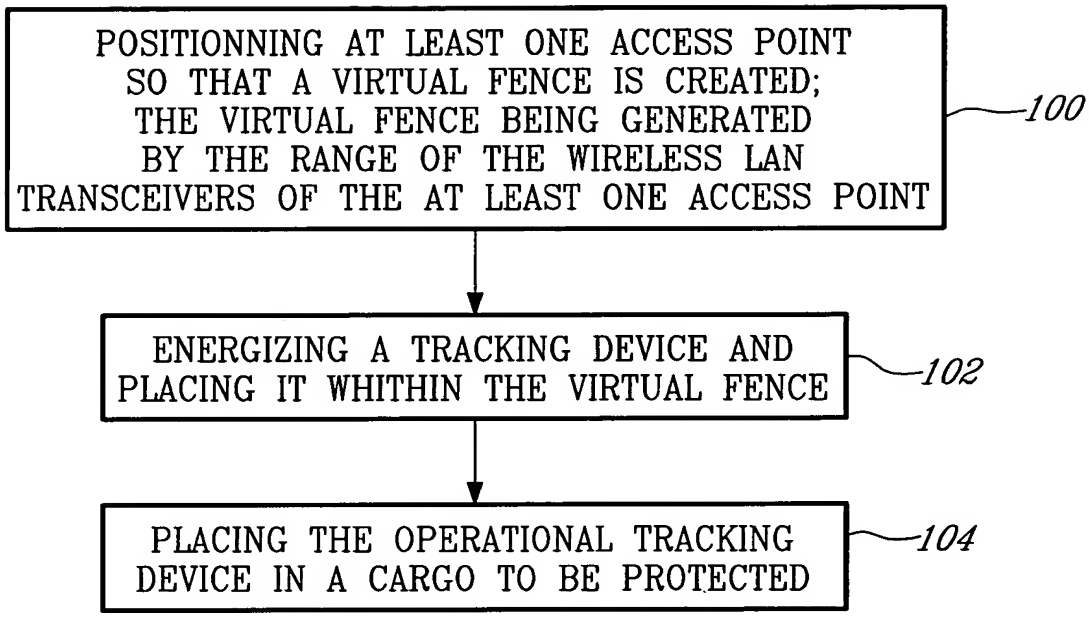
POSITIONNING AT LEAST ONE ACCESS POINT SO THAT A VIRTUAL FENCE IS CREATED; THE VIRTUAL FENCE BEING GENERATED BY THE RANGE OF THE WIRELESS LAN TRANSCEIVERS OF THE AT LEAST ONE ACCESS POINT
100
ENERGIZING A TRACKING DEVICE AND PLACING IT WHITHIN THE VIRTUAL FENCE
102
PLACING THE OPERATIONAL TRACKING DEVICE IN A CARGO TO BE PROTECTED
104

Fig. 5

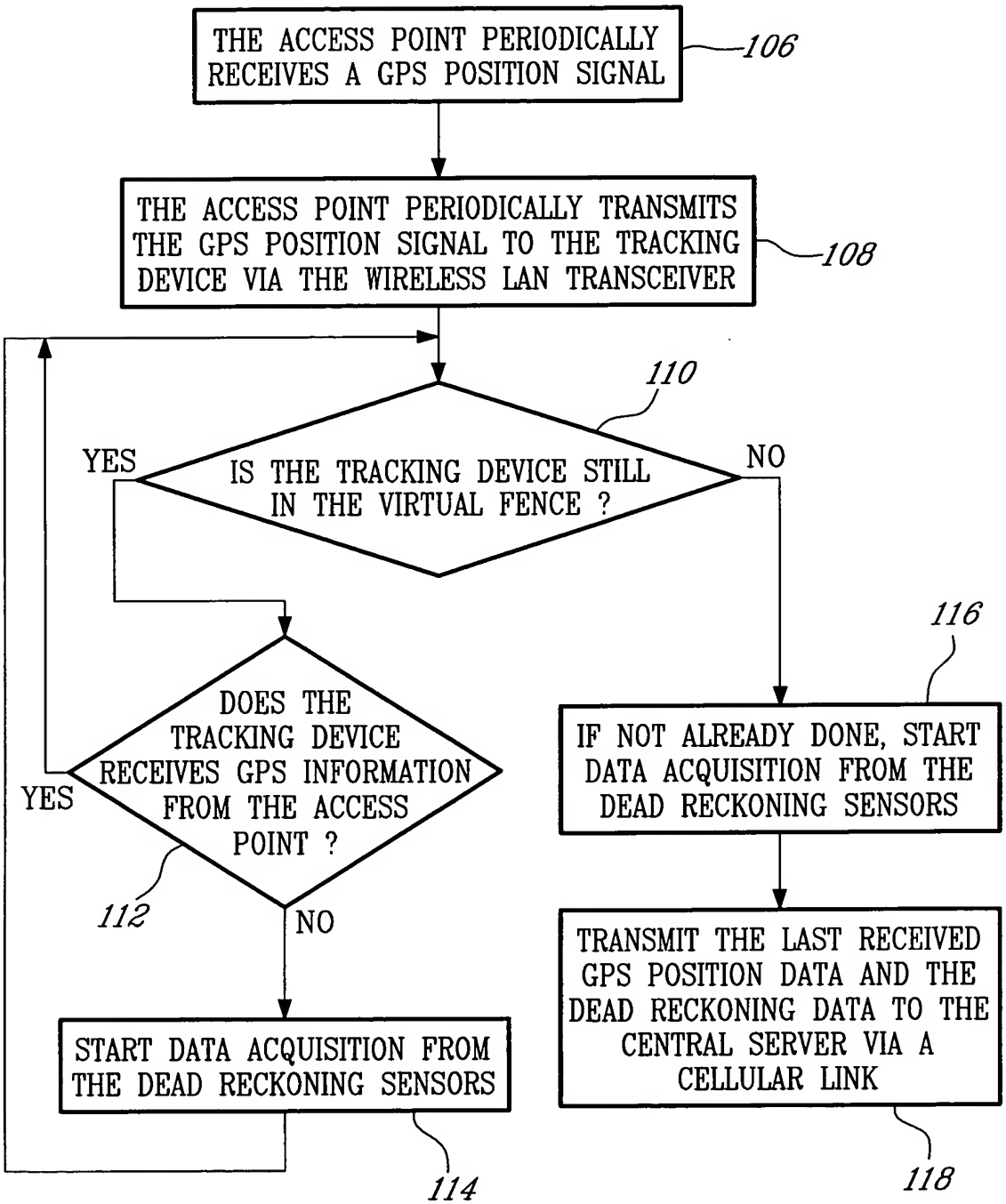
THE ACCESS POINT PERIODICALLY RECEIVES A GPS POSITION SIGNAL
106
THE ACCESS POINT PERIODICALLY TRANSMITS THE GPS POSITION SIGNAL TO THE TRACKING DEVICE VIA THE WIRELESS LAN TRANSCEIVER
108
110
IS THE TRACKING DEVICE STILL IN THE VIRTUAL FENCE ?
YES
NO
DOES THE TRACKING DEVICE RECEIVES GPS INFORMATION FROM THE ACCESS POINT ?
YES
NO
112
START DATA ACQUISITION FROM THE DEAD RECKONING SENSORS
114
116
IF NOT ALREADY DONE, START DATA ACQUISITION FROM THE DEAD RECKONING SENSORS
TRANSMIT THE LAST RECEIVED GPS POSITION DATA AND THE DEAD RECKONING DATA TO THE CENTRAL SERVER VIA A CELLULAR LINK
118

Fig. 6

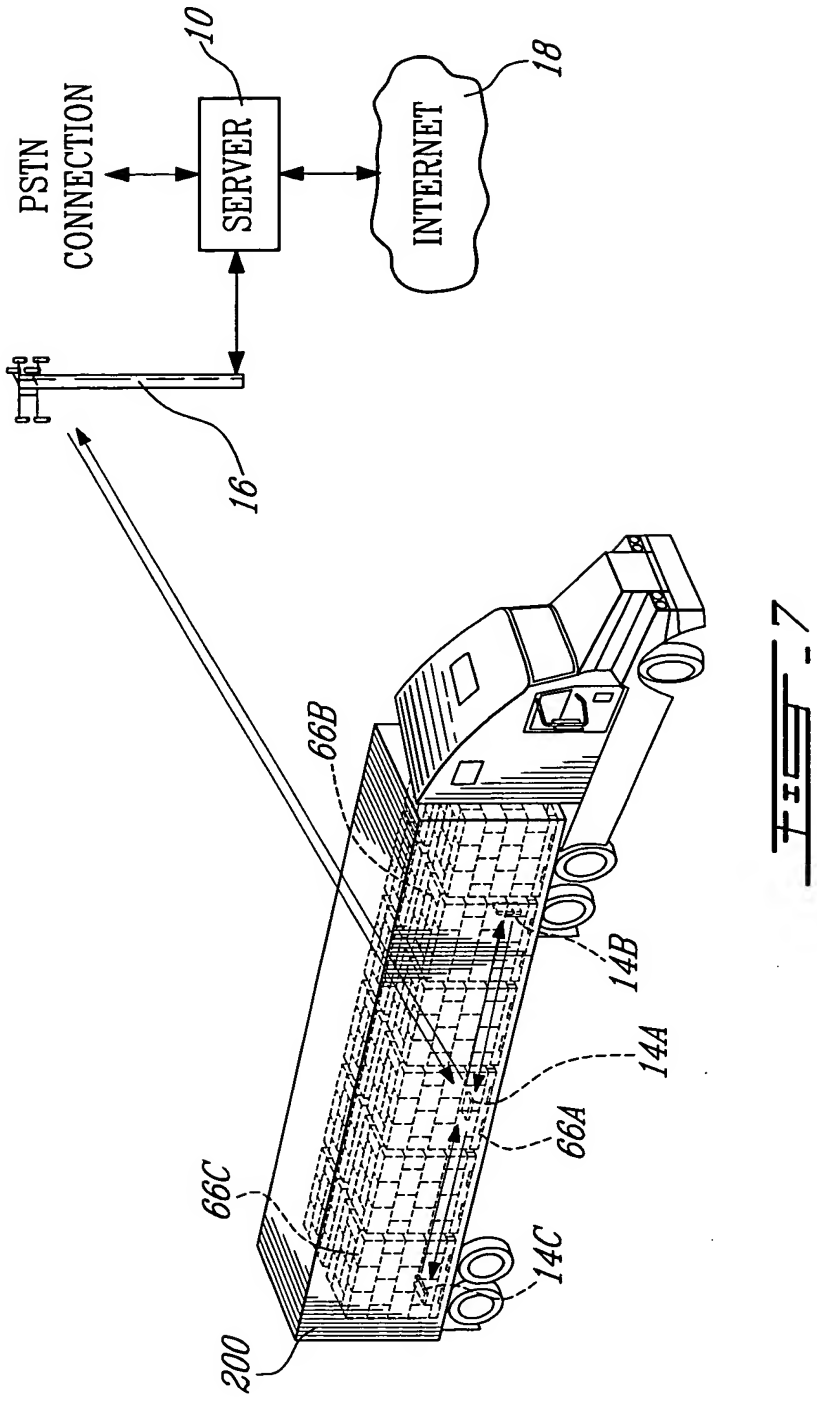
10
18
PSTN
CONNECTION
SERVER
INTERNET
16
66B
14B
14A
66A
66C
14C
200

FIG. 7